



Hemodynamic improvement in Septic Shock Patients treated with CytoSorb: subgroups analysis



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Introduction

In septic patients undergoing hemoadsorption therapy, monitoring specific biomarkers and clinical parameters (noradrenaline, lactate, PCT, CRP, SOFA and MAP) is essential to assess the effectiveness of the treatment. These are all key markers that can help evaluate the efficacy of hemoadsorption. Improvement in these parameters typically suggests better circulatory, metabolic, and inflammatory control, pointing to a positive response to therapy. Tracking these markers together allows for a comprehensive assessment of whether hemoadsorption is contributing positively to the patient's recovery from sepsis.

Methods

We retrospectively evaluated 175 septic shock patients treated with CytoSorb® admitted to our general ICU since 2016, July 1 till 2023 December 31. CytoSorb® was initiated within 24-48 hours from the onset of septic shock. The decision to continue the HA after the 2nd session was left to the attending team. Overall, 90 patients underwent ≥3 procedures and 85 patients underwent ≤ 2 sessions (high and low intensity group, respectively). The cause of septic shock was medical in 55%, surgical in 40% and undetermined in 5% of cases, respectively.

Results

We assessed variables as the time course of the SOFA score, procalcitonin (PCT), C-reactive protein (CPR), lactate, vasopressors and mean arterial pressure (MAP). In all patients, MAP significantly increased and lactate, PCT, CRP, SOFA score and the amount of noradrenaline administered significantly decreased at the end of the treatment as compared with the initial values. When the same variables were compared by subdividing the patients according to the timing and the intensity of the treatment, it appeared that these variations were more marked in more intensely treated early starters (Table 1).

Conclusion

In septic shock patients, treatment with CytoSorb results in hemodynamic and clinical improvement, particularly in early and intense treated patients.

Table 1: Changes of different variables subdivided according to the timing of initiation and the intensity of the treatment.

Variable	Precocity median (IQR): Early Starters			Intensity median (IQR): High Intensity		
	Pre-treatment	Post-treatment	P value	Pre-treatment	Post-treatment	P value
Lactate (mg/dl)	31,8 (16,20-59,30)	17,05 (10,25 - 44,95)	0,02394	23,70 (15,40-40,90)	13,00 (7,60 - 24,50)	0,00230
PCT (ng/ml)	35,70 (6,18-99,25)	9,22 (2,65 - 37,95)	0,00076	29,90 (4,91-90,90)	3,14 (1,51 - 16,68)	0,00002
CRP (mg/dL)	196,40 (114,40-279)	102,65 (47,60 - 190,88)	0,00005	213,50 (127,50-319,20)	88,70 (43,10 - 186,70)	<0,000001
SOFA	12 (9,75-14)	10 (9 - 13)	0,03954	12 (10-14)	11 (9 - 13)	0,00977
Noradrenaline (µg/Kg/min)	0,76 (0,46-1,01)	0,4 (0,10-0,88)	0,00133	0,75 (0,48-10,3)	0,21 (0,06-0,53)	<0,000001
MAP (mmHg)	60 (53-65)	66,83 (50,75-77)	0,00843	63 (56,17-68)	69 (64,25-77,75)	<0,000001
Variable	Precocity median (IQR): Late Starters			Intensity median (IQR): Low Intensity		
	Pre-treatment	Post-treatment	P value	Pre-treatment	Post-treatment	P value
Lactate (U/l)	21,25 (14,48-41,08)	14,35 (8,88 - 42,45)	NS	31,90 (16,05-70,28)	26,50 (10,70 - 97,80)	NS
PCT (ng/ml)	17,40 (3,06-79,40)	3,40 (1,14 - 18,88)	0,00898	29,40 (5,36-81,00)	10,20 (3,14 - 32,81)	NS
CRP (mg/dL)	221,30 (132,40-352,25)	99,40 (48,35 - 184,15)	0,00021	181,20 (100,95-279,50)	112,90 (52,70 - 189,83)	0,00540
SOFA	12 (10-15)	11 (9 - 13)	0,01123	12 (9,50-15)	10,50 (9 - 13)	NS
Noradrenaline (µg/Kg/min)	0,83 (0,50-1,13)	0,48 (0,10-0,92)	0,00236	0,9 (0,51-1,12)	0,86 (0,36-1,20)	NS
MAP (mmHg)	63 (60-70)	67 (57-73,33)	NS	60 (53-67)	60 (45,42-70)	NS